

With the author's kind regards

SYMPATHETIC OPHTHALMIA :

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ITS

SYMPTOMS, DIAGNOSIS, AND TREATMENT.

With Illustrative Cases.

BY

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SYMPATHETIC OPHTHALMIA.

OF all the different forms of inflammation of the eye, there is not one over which the surgeon has so little control as sympathetic ophthalmia. It is the most insidious in its attack, destructive in its progress, and its results are the most irreparable. It almost defies treatment, and, when once established, often runs its course unchecked, to the complete destruction of the eye as an organ of vision.

The primary cause of sympathetic inflammation is the peculiar relationship the nervous systems of the two eyes bear to one another; the mutual sympathy which exists between the two in health becomes more manifested in disease. Light admitted to one eye will cause the pupil of the other to contract, even though it is shaded; and the pupil of a blind eye will often dilate and contract in unison with that of the sound one, when the light is shut off or thrown on. It is a fact of practical importance, that when it is desirable to limit the amount of light to an injured or a diseased eye, both must be shaded, as the affected one will appreciate and resent the stimulus

admitted to the sound eye, almost as much as if it were itself exposed.

Sympathetic ophthalmia differs from all other inflammations of the eye—1. In the cause of its origin ; and, 2. In its nature, and the way in which it invades the tissues of the eye.

Causes of Sympathetic Ophthalmia.—In all cases the cause of this disease is irritation in one eye. This gives rise to a sympathetic action in the other, which may vary in degree from a slight irritability to an acute ophthalmitis, terminable only in the complete destruction of the eye. Sympathetic inflammation may arise—1. From an injury inflicted on one eye ; and, 2. From the irritation dependent on abnormal changes taking place within an eye already lost.

1. *From injury inflicted to one eye.*—The most frequent cause of this affection is undoubtedly an injury to one eye, but the situation and class of wound influence very materially the chance of this sympathetic action being started in the other. Wounds in the ciliary region, or that part which extends for about one-eighth of an inch or more backwards from around the cornea, a space in which the ciliary muscle and ciliary processes lie, are peculiarly liable to produce sympathetic irritation in the sound eye.

A simple wound of the cornea, even though it be of considerable extent, provided none of the deeper tissues are implicated, will generally speedily heal, and beyond the impairment of vision caused by

the scar, no further evil will probably follow ; but if the cut be extended into the ciliary region, the danger is immensely increased, not only to the eye itself, but in the risk to which the other is exposed of taking upon itself a sympathetic action.

Wounds of the cornea, accompanied with large prolapse of the iris, are prone to excite irritation in the other eye, and especially if the patient be a young child. This danger is increased if the cut is near the margin of the cornea, and if the prolapse is large and pulls upon the ciliary processes.

The nature of the injury is of great importance in its influence on the other eye. Contused wounds caused by blows on the eyes are very dangerous. In such the rent or split usually occurs in the ciliary region, just behind the cornea, horizontally or parallel with its margin. Penetrating wounds with semi-blunt instruments, such as the points of a pair of scissors, a steel pen, or a crochet-hook, especially if inflicted in the ciliary region, are peculiarly liable to give rise to sympathetic irritation of the other eye.

Foreign bodies, such as fine particles of iron, chips of stone, or small fragments of guncaps which have flown off from the explosion of the detonating material within, often penetrate the eye, and if not removed generally produce the most disastrous results. The eye may be either destroyed by the acute inflammation which follows, and the sound eye sympathising may be also lost ; or it may recover partially from the first acute symptoms occasioned by

the injury, and subside into a chronic inflammatory state, which slowly but surely destroys the eye, and often imperceptibly involves the other in a subacute sympathetic iritis, which ends only in complete or almost total loss of vision.

The age of the patient also bears a remarkable influence on this disease.—The young are much more prone to it than the old, and it runs its course more rapidly in the child or the young adult than it does in the middle-aged or the old. This might be reasonably anticipated, for the excitable nervous energy and quick circulation of the young predispose them to all diseases which depend on irritation of any portion of the nervous system.

2. *Sympathetic inflammation dependent on abnormal changes taking place in an eye already lost.*—Eyes which either from injury or disease have ceased to be organs of vision usually undergo a slow process of disorganisation. The original tissues gradually waste, become altered in texture, and new products are often formed. These changes are, as a rule, very slow. There may be no evidence of their having even commenced until many years after the eye has been lost. Nevertheless, I believe that atrophy and waste of the tissues speedily begin in an eye which has ceased to see on account of changes induced by a destructive inflammation, no matter how that inflammation has originated; but it may require years to effect a complete disorganisation or change of structure. The exception to this, I think, is in

eyes which have been lost from perforation of the cornea in purulent ophthalmia, or from any disease which blinds by a destruction of the cornea without implicating the deeper parts. These will continue for many years, and indeed for long lifetimes, without giving their owners any annoyance whatever. The fundus in such eyes is healthy, a gradual atrophy takes place from disuse, and they may shrink, but they still remain quiet.

This is not, however, always the case, for the parts within may waste more rapidly than the globe by shrinking can accommodate itself to its lessened contents, and the relative connection of the internal structures thus becomes disturbed. From atrophy of the vitreous, its consistency and bulk are diminished, and the retina, deprived of its natural support, falls forward and becomes separated from the choroid, which may still maintain its normal position with the sclerotic. This space gets filled up by some adventitious deposit, capable either of becoming organised and forming a new growth, or at some future period of undergoing degeneration.

The lost eyes that are most apt to give trouble are those which have come to their end from an acute deep-seated inflammation, or from an injury. In both we have new products thrown out within the eye, disarranging in some cases the proper relationship of the tissues to one another, and in others materially altering the structure of the tissues themselves. The iris, the choroid, and the retina may be completely

changed from effusions within their substance ; or the relative positions of the choroid and retina may be destroyed from lymph, serum, or pus separating them from one another. The vitality of these structures is necessarily impaired by the inflammatory action which has destroyed the eye ; their reparative power is greatly diminished, and the effusions which have been poured out, instead of being absorbed and disposed of, either become organised and form new products, such as bone or fibrous tissue, or else remain unaltered, until from some cause or other they commence slowly to disorganise. The chronic changes which take place in such eyes render them liable to frequent attacks of inflammation ; and although these may not be very severe, yet they are peculiarly prone to induce sympathetic irritation in the other or sound eye. So important a fact is this, that I think it becomes a serious question whether, when an eye is irreparably lost, it is wise to keep it.

The nature of sympathetic inflammation, and the way in which it involves the other tissues of the eye.—It is essentially an adhesive or fibrinous inflammation. Seldom if ever does an eye affected with sympathetic inflammation suppurate. Its tendency is to rapid plastic effusions, which soon become organised and incapable of absorption—blending the different tissues together, impairing their textures, and destroying their functions. Repair seldom follows an arrest of the disease ; the damage it has inflicted remains. Very insidious in its attack, the eye

is generally though not always invaded by the disease *without* having pain as a warning of its presence. It often creeps on unheeded by the patient, and the first symptom which frequently draws the attention to the apparently sound eye is a slight defect in the ability to define clearly, and a general pinkiness of the globe. In children I have seen the disease thoroughly established before they have been brought by their parents for advice, simply from the fact that the absence of pain induced them to think lightly of it. When once fairly started it is an inflammation very difficult to subdue, and even when arrested *it is liable to frequent recurrence*. The iris, choroid, or ciliary processes are the parts primarily affected by the disease; but the other tissues may and do become secondarily involved. In some cases it seems to originate in and limit itself to the anterior structures of the eye, leaving the fundus healthy, as in a case under the care of Mr. Critchett, where after an arrest of the disease he succeeded in extracting the lens and making a new pupil, and in restoring to the patient a very useful amount of vision. In other patients the choroid and deeper structures become implicated, and total loss of sight ensues. As a rule, the disease commences in the iris, and its progress is backwards towards the choroid. It may, however, occasionally commence in the choroid, and extend forwards to the iris.

The peculiar disposition of this inflammation to the rapid effusion of lymph is manifested at the very

commencement of the disease. At a very early period the pupil is fixed from adhesions between it and the anterior capsule of the lens, and the whole tissue of the iris appears as if it were soaked in lymph. It is not deposited on the surface in nodules, as in syphilitic iritis, but occurs in the form of an infiltration invading the very texture of the iris. In the synechia which is formed, it is not simply the pupillary margin of the iris which contracts adhesions to the capsule of the lens, but the whole of its posterior surface, gluing it down and incorporating it with the lens-capsule; so that if at a future period an attempt is made to form an artificial pupil, and a portion of the iris is torn away, it is common to find the exposed part of the capsule covered with urea, indicating exactly the extent of adhesion which had existed between it and the posterior surface of the iris.

At an early period of the disease, when the iris is saturated with lymph, it is soft and rotten, for this is the only word which conveys to the mind its actual condition. Attempt at this stage to remove a portion of it, and the hook will go through it like tinder, or the forceps will only bring away the particle which it holds between the extremity of its blades, tearing it away from the rest. At a later date, when all the acute symptoms have passed away, the iris has become completely changed in its character; it is excessively tough, has completely lost all its elasticity, and is converted into a dense fibrous membrane. In

the endeavour to remove a portion of it to form an artificial pupil, the hook is often unable to penetrate the texture, and scissors are required to cut it; but the cut made in it remains only as a slit, no separation or retraction of its edges taking place. The lymph, which in the early stage was infiltrated into its substance, has now become organised and been converted into a fibrous tissue.

Tension of the eye.—The tension of the sympathetically inflamed eye is often, though not necessarily, manifestly increased, in some cases to the extent of + T 2 or 3, so that the globe cannot be indented with the fingers. This state of increased tension is confined to the early stages of the disease, which may however extend over many months, or even beyond a year. It may accompany the acute or subacute symptoms of the disease which precede atrophy. If the disease runs on unabated and unarrested, the increased tension subsides, and the eye gradually becomes softer than normal, and sinks to — T 2 or 3. The vitreous slowly atrophies, loses consistency and diminishes in bulk, and with these changes the eye softens. But, worst of all, as the atrophy of the vitreous proceeds, the retina is deprived of its normal support, and falling forwards becomes first in part, and often at last entirely, detached from the choroid.

Symptoms of sympathetic ophthalmia.—These may vary from symptoms of mere irritation to those of actual inflammation of the eyeball. The symptoms

are of two kinds:—1. Those which relate to the nervous, and, 2. Those which belong to the vascular system of the eye.

The nervous symptoms always show themselves at an early period. Slight photophobia, with some lachrymation, is present in every case, though varying in degree. The dread of light does not become severe until the disease has been thoroughly established, and even then it is not so intense as in many other affections. An inability to define clearly and to read small print without a distinct feeling of discomfort is a symptom so often seen at an early period of the disease, while the humours are still clear, and the eye admits of an ophthalmoscopic examination to verify this fact, that I believe it is referable to a want of power of the ciliary apparatus to focus the eye correctly for near objects, and consequently to an imperfect image being formed on the retina.

The symptoms which arise from a derangement of the vascular system of the eye manifest themselves in a rapid effusion of lymph, capable of speedy organisation.

If the eye at an early period of the disease be examined with the ophthalmoscope, great congestion of all the choroidal vessels will be seen. It is possible that the general arterial congestion may be due to some impaired condition of the sympathetic system of the eye, so that the vessels, losing the control of the sympathetic filaments, which in a

normal state exert a powerful influence in maintaining a proper tonicity of their coats, become distended, and that this passive engorgement favours the rapid effusions which characterise this disease.

General summary of symptoms.—At the commencement of the attack, the eye is irritable and abnormally sensitive to light ; there is some lachrymation, the conjunctiva is a little injected, and the pupil decidedly sluggish in its action ; the power of focusing the eye for near objects is diminished ; and the patient is unable to maintain a prolonged accommodative effort. Reading or any fine work quickly induces a fatigue which is followed, first by the words becoming confused and blurred, and, lastly, if the eyes are not rested, by a complete loss of their image. A few minutes' rest and the eye can begin its work again, but the same symptoms again shortly appear and oblige it to desist.

If the disease progresses, the globe from sclerotic injection assumes a pinkish appearance, with a distinct ciliary zone around the cornea, showing internal congestion. The pupil contracts adhesions to the anterior capsule of the lens, and becomes stationary ; or if atropine is dropped into the eye, it dilates only slightly, irregularly, and partially. The aqueous becomes serous, and the striation of the iris, at first indistinct, is afterwards completely lost. At the onset of the disease there is frequently *no pain*, not even sufficient to draw proper attention to the eye ; but in the later stages the globe is tender to the

touch, and there is frequently supra-orbital pain. Lymph is speedily effused in large quantities as an infiltration into the different tissues involved in the inflammation; the pupillary area of the capsule of the lens is covered and the iris almost soaked with it, which, rapidly becoming organised, contracts firm and close adhesions between the posterior surface of the iris and the lens-capsule. Commencing generally in the iris, it extends itself back to the choroid, and a form of irido-choroiditis is established, very difficult to arrest.

Treatment.—In the treatment of sympathetic inflammation of the eye, we must consider—1. How to arrest the progress of the disease; and, 2. How to deal with an eye which remains damaged after the disease has been arrested.

1. *How to arrest the progress of the disease.*—If the sympathetic inflammation of one eye is dependent on injury to the other, and it is clear that the wounded eye is a lost one, or if it arises from the irritation of the remains of an already lost eye becoming inflamed, then there cannot be a moment's hesitation about the propriety of at once removing the exciting cause of the disease, and extirpating the diseased or the injured eye.

The removal of an eye by the present operation is so simple a proceeding, attended with so little annoyance to the patient, and is at the same time generally followed with such decided benefit, that it is the absolute duty of the surgeon to urge it, when necessary, in

the strongest manner. Very frequently, after thus getting rid of the primary source of irritation, the sympathetic symptoms in the other eye will rapidly subside.

The importance of removing at an early period an eye which has been so injured as to be useless, and which is exciting irritation in the other, or the inflamed remnant of a lost eye which is acting in the same prejudicial manner, cannot be exaggerated; for though *in the very early stage* of sympathetic ophthalmia the removal of the cause of irritation will and generally does cause its subsidence, yet when the disease has thoroughly taken hold of the sound eye, even the removal of the lost one may fail to arrest its progress.

But suppose the sympathetic irritation is due to a wound in the other eye, but that the injury has not been quite sufficient to destroy sight, how then should we act? In such a case, if I saw the patient suffering with the one eye in the *early stage* of sympathetic ophthalmia, I would unhesitatingly sacrifice the injured eye with the hope of saving the other.

General treatment.—Absolute rest to the eyes is imperatively demanded; all reading, writing, or fine work of any kind, must be forbidden; when at home, the room should be kept darkened, and, when out, dark glass goggles should be worn. It is impossible to overrate the importance of keeping the patient for a long period in a very subdued light; it affords the best hope of success, and places the eyes in

a position to receive most favourably the influence of any other treatment which may be adopted. However well the patient may progress, the order to rest the eyes and abstain from work should not be rescinded for at least from six to eight months. The disease is very recurrent in its nature, and the too soon exposing the eye to the stimulus of strong light will increase the chances of relapse.

In some cases I have seen decided benefit from a moderate inunction of mercury, but quinine in one or two-grain doses must be given at the same time.

Local applications.—Belladonna in one form or another affords the most grateful application to the eyes. A solution of atropine, of the strength of one grain to the ounce, should be dropped into the eye three or four times a day. It has a double effect: it is a direct and very excellent sedative to the eye, allays irritability and relieves pain, and sometimes it seems to exert almost a specific action on the disease; but in addition to this it dilates the pupil, and so helps to destroy recent adhesions, and by maintaining the dilatation tends to prevent the formation of a closed and contracted pupil. The frequent use of a belladonna fomentation also gives great comfort.

At one time I used to think that if an iridectomy was performed on the affected eye at an early stage of the disease, it helped to quiet it, and by the removal of a piece of iris it established an artificial pupil, and exposed a portion of transparent lens, if lymph had already been effused on the lens-capsule

within the pupillary area. Experience has now made me think and act differently. I believe that whilst the eye is actively inflamed, operative interference is positively prejudicial; an iridectomy, if attempted, is performed under very unfavourable circumstances, and is generally indifferently accomplished: for the iris, soaked with lymph, is so friable that it tears before the hook or the forceps, and but a small portion of it is removed; the irritation of the eye is increased rather than arrested, and fresh lymph speedily fills the space made by the removal of the iris. No attempt to form a new pupil should be made until the disease has been quite subdued and the eye is quiet.

2. *How best to deal with an eye which remains damaged after the disease has been arrested.*—If the disease has been stayed before the deeper parts of the eye have been seriously implicated, and a fair perception of light remains, much may be done to restore useful vision to the eye. The condition of the eye after an attack of sympathetic ophthalmia will vary according to the intensity of the disease to which it has been subjected. But to consider a severe though not an extreme case:—the pupil will be found closed and contracted; its margin, and probably also the greater part of the posterior surface of the iris, bound to the capsule of the lens, and the small pupillary space filled up with a dense false membrane; the iris has been altered in structure and become fibrous, and its elasticity has been

destroyed. In such an eye an ordinary iridectomy would fail, partly because it would be difficult if not impossible to get away sufficient iris to form an opening large enough for an artificial pupil, and partly from the portion of lens which would be exposed if an artificial pupil was successfully made, having its capsule coated with urea, owing to the adhesions which had existed between it and the posterior surface of the iris. It is generally, therefore, advisable in such severe cases to get away the lens at the same time that the operation is performed for making the artificial pupil.

The plan which has been adopted by Mr. Bowman and Mr. Critchett has given very favourable results. An iridectomy-knife is used to make an opening at the margin of the cornea, as in an ordinary operation for iridectomy; but the point of it is carried beyond the pupil, and made to dip downwards, so as to make a transverse cut in the iris just below the pupil; the blades of a pair of fine scissors are then introduced through the opening at the margin of the cornea, one blade in front of and the other behind the iris; and a cut is made first on one side to join one extremity of the transverse slit below the pupil, and the same proceeding is then repeated on the other side to make a similar cut to join the other end of the transverse incision. The somewhat oblong-shaped piece thus included in the section consists of iris, and a portion of the anterior capsule of the lens adherent to it. The piece is then lifted away by a pair of forceps,

and the lens-matter behind removed by a curette or cataract-spoon.

In some of the milder cases, where the tissue of the iris has not been so much changed, and where the adhesions between it and the lens-capsule have not been so complete, an artificial pupil may be made by some one of the ordinary operations. An iridectomy however, when it can be performed, is the best proceeding; and if the portion of lens exposed by the removal of the iris is found to be clear, a good useful eye will result.

The following Cases are illustrations of the remarks I have made :—

CASE I.—*Wound of the cornea of the right eye, with prolapse of the iris, from a blow with a stone, followed by sympathetic ophthalmia of the other eye. Frequent recurrence of the disease. Removal of the injured eye ten months after the accident. Relief.*

Mary R——, ætat. 8, was brought by her mother to the hospital on April 22, 1864. Five days previously, a stone thrown by a boy struck her right eye, and inflicted a wound in the cornea, through which a piece of iris immediately prolapsed.

State on admission.—The eye was very red and irritable, and unable to bear any exposure to light. There was a wound in the cornea at the lower and

outer part, extending from just below the margin of the pupil to near its circumferential border. Through this wound the iris had prolapsed, and the bulging portion was covered with lymph. The lens apparently was not wounded, nor did the iris seem to have been cut; it simply bulged through the wound, drawing the pupil towards it. The aqueous, though a little serous, was transparent, and the striation of the iris quite distinct. Ordered—

Belladonna fomentation.

Pulv. Hyd. c. Cret. c. Rheo, gr. viii. at bedtime,

and to keep in a darkened room.

April 26.—The child is decidedly better. The eye is more quiet. The prolapsed iris is covered with lymph, and the edges of the wound in the cornea appear to have united to it. The prolapsed iris formed a button, which projected considerably, from the aqueous within distending it. This I snipped off with a pair of scissors, and a little aqueous immediately escaped. To continue the belladonna fomentation.

May 2.—The eye is now quite quiet; the redness has almost disappeared; she has no pain. There is a good anterior chamber; the aqueous is clear, and the pupil acts well.

May 12.—The eye apparently well. The patient now ceased her attendance at the hospital.

June 10.—The child was again brought to the hospital. The injured eye was slightly irritable; there was some photophobia and slight sclerotic

redness. It was for the *left or uninjured* eye for which the mother now sought advice. The cornea was cloudy, the pupil stationary, with complete posterior synechia—the aqueous serous but clear. The ciliary zone of red vessels around the cornea was distinct; the whole globe had a pinkish appearance, and there was a slight dread of light. The vision was much impaired; she could only read No. 16 of Jaeger's test-types. The child had suffered *no pain whatever* in the eye, and had slept well. The only symptoms the mother had noticed were a slight intolerance of light, and a trifling redness of the eye; but as the eye was evidently getting worse, she sought advice for it. It was about a fortnight since she first noticed that the eye was not quite well. Ordered—

To be rubbed into the axilla, Ung. Hydrarg. ʒ ss. every night; and to take

Quinæ Disulph. gr. $\frac{1}{2}$;
 Acid. Sulph. dilut. ℥ v.;
 Aquæ ʒ ss.; three times a day.

And to drop into both eyes a solution of

Atropiæ Sulph: gr. j. Aquæ ʒj; three times a day.

She was told to procure a pair of goggles with dark neutral-tint glasses to wear habitually, and the room in which she lived was to be kept darkened.

June 14.—Much the same. Cornea still very hazy, complete posterior synechia; the eye very pink; not so much photophobia. The injured eye is vascular in the immediate site of the wound, but in neither eye does she suffer any pain.

June 21.—The mouth slightly affected by the mercurial inunction; the eye decidedly better; there is less photophobia and redness. To continue the unguent. hydrarg. every other night, and to repeat the medicine.

June 28.—The eye is more quiet, and there is but little dread of light; the cornea is almost clear, and the aqueous is less serous. To repeat the quinine medicine, but omit the mercurial inunction.

The eye from this date steadily improved; the redness disappeared, and all active disease ceased: but, as the result of the inflammation to which it had been subjected, there was complete posterior synechia, and the lens-capsule within the pupillary area was covered with a film of lymph. The eye was also irritable, and when exposed to a full light, by removing the dark glass goggles which she habitually wore, would flush up. About the second week in July she went into the country, with special injunctions to abstain from all use of the eyes for six months, to continue the use of the dark goggles, and when in the house to keep the room darkened. This arrest of the disease was, however, only for a time; for every few weeks the eye would become irritable and inflamed, and she would come to the hospital for relief. Under soothing and tonic treatment, all irritation would soon cease, and she would discontinue her attendance for a while, but only to return again after a short interval. In the beginning of February of this year, a more acute attack than usual brought her to the

hospital; and as the sight of the injured eye was now quite lost, and the irritation in the other very severe, I strongly urged the mother to have the injured eye removed; and to this she consented.

Before the operation, the state of the injured eye was as follows: The globe soft, its tension —T 2; the iris almost in contact with the cornea; on its surface could be seen with the unaided eye large red varicose vessels. There was a cicatrix in the cornea marking the seat of the injury, and to it the lower and outer edge of the iris was drawn. The sclerotic was reddened, and the ciliary zone of vessels distinctly marked. The eye was removed on February 13. After its removal, it was examined by Mr. Hulke and Mr. Bader, and their report is as follows:—Œdema of the retina with fibrillated exudation and swelling of the connective elements, especially the radial fibres; œdema and purulent infiltration of the choroid, with swelling and incomplete disintegration of the hexagonal epithelium. The whole vitreous semi-opaque, and infiltrated with a fibrillated substance.

February 21.—The left eye is decidedly improved since the source of the irritation has been taken away. The globe is less vascular and more tolerant of light; with it she is able to read No. 16 Jaeger's types; tension, normal. No great improvement can be expected in the vision, as the pupillary area is blocked up with lymph, and there is complete posterior synechia.

Remarks.—In this patient, the insidiousness of the

disease, its severity, and its recurrent nature are well marked. From the complete absence of pain, it was not detected by the mother until it had become fully established, and had already committed irreparable damage to the eye, in the sealing-down of the pupillary edge, and probably also a portion of the posterior surface of the iris, to the anterior capsule of the lens. By soothing applications to the eye and a gentle mercurial course, the disease was for a time arrested, but only to recur again and again at short intervals. The removal of the injured eye exercised a specially beneficial influence in allaying the last attack of inflammation; and there is reason to hope that with the removal of the exciting cause the disease may be stopped, certainly that the chances of its recurrence are materially diminished.

CASE II.—*Injury to right eye from a punctured wound at the margin of the cornea, extending into the sclerotic, followed by sympathetic ophthalmia of the other eye.*

Kate S——, ætat. 9 years, came under the care of Mr. Bowman in February 1864. She was endeavouring to untie a knot with the point of a pair of scissors, when they slipped; and the point of one blade penetrated the right eye at the lower and inner margin of the cornea, inflicting a wound which extended into the sclerotic. The eye, after a certain

amount of inflammation, which her mother says did not give her much pain, became apparently well, and in between seven or eight weeks she went into the country. About one month after this the injured eye became again inflamed, and at the end of a week from this time the child noticed that the sight of the left (the uninjured) eye was failing rapidly. *She had never suffered any pain in it.* There was a slight dread of sight, but not much, and the eye looked a little bloodshot. The child was now seen by Mr. Bowman, who ordered her small doses of the hydrarg. bichlorid. with tinct. cinchonæ, and a belladonna lotion to bathe the eyes with frequently : she was told habitually to wear goggles with dark glasses, and to avoid all exposure of the eyes to strong lights. Under this treatment the irritation of the left eye subsided, but only to recur again and again.

On *March 7*, 1865, the mother brought the child again from the country. The left eye was more irritable than usual. The following was the condition of the two eyes:—

The right eye (the injured one).—A cicatrix at the junction of the lower and inner part of the cornea with the sclerotic ; the pupil is small and contracted, the pupillary space filled with lymph ; there is complete posterior synechia, and the iris is bulged forwards toward the cornea, so as almost to come in contact with it. The tension of the eye is + T 3 ; with it she can only distinguish shadows.

The left eye.—Irritable and of a pinkish colour; the pupil irregularly adherent to the lens-capsule, and the pupillary area of the capsule of the lens covered with lymph, with the exception of a small spot at the lower and outer part, through which she is able, with her head thrown to one side, to read with difficulty words of No. 1 Jaeger's types. Tension, + T 2.

Mr. Bowman excised the injured eye, but declined doing any operation for the present to the left eye; he thought it advisable to wait until all irritation had ceased. The left eye decidedly improved after getting rid of the source of the irritation, and up to the present time has been progressing favourably.

In this patient also, as in Case I., the peculiar insidiousness of the disease and its recurrent nature were well marked. The child suffered no pain, and scarcely any photophobia; yet the severity of the inflammation to which the eye has been subjected is evidenced from the results which it has left behind it.

In the two next Cases related, the injured eyes were excised as soon as it was discovered that they were acting prejudicially on the sound ones; and as the disease in each patient was in its very early stage, the operation succeeded in arresting it.

CASE III.—*Rupture of the cornea extending into the ciliary region from a blow with a fragment of iron. Symptoms of sympathetic irritation in the other eye seven days after the injury. Removal of the lost eye. Recovery.*

E——W——, ætat. 30, a boiler-maker.—His usual occupation is striking rivets. He applied to the hospital on August 26, 1862, on account of an accident to the right eye four days previously. Whilst striking a rivet, a fragment flew off and struck the right eye with great violence; since then the sight of that eye has been quite lost.

State on admission.—A wound extended obliquely across the cornea from its upper and inner border, where it involved the ciliary region to within two lines of its lower and outer margin. At the lower and outer part, the iris had been separated to the extent of one-eighth of an inch from its ciliary attachment. Blood still remained in the anterior chamber: the globe was much injected and painful—its tension normal. Leeches were applied to the temple, and hot belladonna fomentations to the eye.

The man says that the fragment of iron which struck the eye was about one quarter of an inch in size, judging from the surface of the rivet from which it was detached. We may therefore fairly conclude no foreign body is lodged within the eye.

August 27.—The eye still very painful, the lids

swollen, and some chemosis of the conjunctiva. He has no perception of light; the left eye is rather irritable.

August 28.—The chemosis has increased, and the globe is evidently about to suppurate. The left eye is very watery and irritable; it has a pinkish appearance, with the ciliary zone of vessels distinct. He complains that objects with that eye look slightly dull.

As it was certain that the right eye was lost, and the left had symptoms of sympathetic irritation, the injured eye was excised.

August 29.—Has passed a good night, and is free from pain. In a week from this date he was discharged to attend as an out-patient.

All irritability ceased on the cause of the irritation (the injured eye) being removed.

CASE IV.—*Severe injury to the left eye from a penetrating wound involving the ciliary region, followed by sympathetic irritation of the right eye. Removal of the injured eye. Recovery.*

R—— M——, ætat. 35, a shipwright, applied to the hospital on December 6, 1862. His history was as follows:—

Five weeks ago, whilst working in the hold of a ship, a man on the opposite side thrust an auger with great force through a small hole, not knowing that anyone was near; and it struck him full on the left eye, causing a severe contused and penetrating wound. The wound was a jagged one, and extended

from the upper to the lower margin of the cornea, involving the ciliary region at its upper and lower edge. Immediately after the accident, he was quite blind with that eye. For the next two or three days he suffered so severely as to prevent his obtaining sleep; and for the three following weeks he experienced considerable pain in the head, around the eye, and in the eye itself. The eye is a lost one, and is now giving rise to the following symptoms in the other:—

About a fortnight ago he noticed that the objects he looked at danced as it were before him, like (he said) shadows on a sunny day; that when he attempted to seize anything he missed his aim, and it required a concentrated effort to catch hold of a small object at an arm's length. His sight was misty, and the outline of bodies indistinct. He had some lachrymation and pain of a dull aching character in that eye, corresponding (he says) in situation to the wound in the injured one, where there is still at times a shooting pain. The pupil is rather contracted, and its range of action limited. The whole globe looks pink, and there is a distinct ciliary zone. The man was admitted into the hospital, and I removed the eye.

December 9.—The man is quite free from pain, and able to be about. He suffered no inconvenience whatever from the operation. The right eye is very decidedly improved, and, although still rather irritable, the pupil is active, and his power of defining much increased. He continued to improve, and in a few days left the hospital, wearing a glass eye.

The Cases V., VI., and VII. are examples of sympathetic ophthalmia induced by the irritation excited by abnormal changes taking place in old lost eyes.

CASE V.—*Severe sympathetic ophthalmia occurring in the left eye consequent on inflammation of the other, the sight of which had been lost twenty years previously. Result, total blindness.*

S—— H——, ætat. 25, came to the hospital in December 1862, to seek advice concerning the right eye, the sight of which he had lost nearly twenty years previously. The cornea was nebulous; a portion of the iris had evidently been removed for the purpose of making an artificial pupil, and some opaque capsule occupied the irregular pupillary space. The eye was soft, and as an organ of vision useless; it was liable to attacks of inflammation, which gave him considerable annoyance. As the eye was then quiet, there was no need for active interference; but the patient was strongly advised, if it again became troublesome, to come at once to the hospital and have it removed, as it was very possible it might act injuriously on the sound eye.

On *July* 11, 1863, he again came to the hospital on account of the bad eye being inflamed and painful. Its removal was urged, but in vain; he was treated with belladonna fomentations and tonics, and all active mischief for the time ceased. His great objection to having the eye removed was, that as he

was subject to epileptic fits, he did not like to wear an artificial eye.

In *November* of the same year he was again suffering from a recurrence of the inflammation, but under the use of soothing applications the eye sufficiently recovered to enable him to cease his attendance at the hospital.

On *March* 8, 1864, he returned to the hospital with the right eye again inflamed, and he was strongly urged to part with it, but he positively declined to submit to the operation.

On the 22nd of the same month, the left eye began to show symptoms of sympathetic irritation. The whole globe had a pinkish appearance ; there was a ciliary zone of redness around the cornea, and a decided dimness of vision. He was unable to define clearly, and it was with difficulty he could read No. 2 Jaeger's type : even then he refused to submit to the removal of the right eye.

On *March* 28, the symptoms of sympathetic irritation in his left eye were much more manifest, and active deep-seated inflammation was present. The whole eye was very red, the aqueous serous, and the pupil fixed : he was now not only willing, but anxious, to part with the right eye. He was at once admitted into the hospital, and I removed the eye which had given him so much trouble.

From the operation he made a good recovery ; but the disease, which was now thoroughly established in the left eye, was not arrested : unhappily, it steadily

progressed. On April 11 he was unable to count fingers, and since then he has become totally blind. Had the patient submitted to the removal of the source of irritation at the commencement of the attack of sympathetic ophthalmia in the good eye, there would have been a much greater chance of his recovery ; but the delay in his case unfortunately rendered the operation, though his only chance, too late for success.

CASE VI.—*Sympathetic irritation of the left eye consequent on destructive changes going on in the stump of the right eye, which had been lost forty-five years.*

W—— E—— applied to the hospital on January 15, 1864, on account of the stump of the right eye (which he had lost from an accident forty-five years ago) having become inflamed. From the time of the accident up to six weeks previous to his admission he had never suffered any inconvenience from it ; without any apparent cause it then became inflamed, and ever since he has had continued pain in it.

The *left eye* was irritable and congested, and he complained of dizziness and an inability to define clearly surrounding objects. He was admitted into the hospital, and I removed the remnant of the right eye, which was much inflamed and evidently acting as an irritant to the left one.

On making a vertical section of the eye, the choroid was seen in apposition with the sclerotic, but

the retina was bulged forward, and the space between it and the choroid occupied by a thick bony plate. All annoyance ceased after the operation, and in four days the man left the hospital convalescent.

CASE VII.—*Sympathetic ophthalmia in the left eye induced by inflammation of the remains of the right eye, which had been lost by an injury between seventeen and eighteen years before.*

This patient came under the care of Mr. Critchett at the Ophthalmic Hospital on December 27, 1864. The history of the case is the following:—Fred. C——, ætat. 22, by trade a blacksmith, an employment he has been following for the last eight or nine years. Between seventeen and eighteen years ago, he accidentally ran a penknife through the cornea of the right eye, from which injury the eye was completely lost. As far as he can remember, he has never since had even perception of light with it.

Up to within the last two or three years it has never given him any trouble. Since then it has been occasionally inflamed, but not so painfully as to prevent his attending to his work; and he has taken no notice of it, as after a few days the redness of the eye would subside. About two months ago the right eye became more inflamed than it had ever been before, and this time it was rather painful, and three or four days after the commencement of this attack the left eye first became bloodshot. He had *no*

pain, but the eye was slightly red, and everything he looked at appeared dull. He frequently saw bright flashes. The sight gradually became more dim, and he has been obliged to cease from his work.

Present State.—*The right eye* a lost one, shrunken about one-fourth. The lower half of the cornea has chalky deposit in its laminae, and its surface is rough and uneven. The upper half of the cornea is clear, and through it a portion of iris can be seen lying in contact with the cornea. The tension of the eye is diminished—T 2. The globe is inflamed and irritable, but not at present painful.

The left eye has the pinkish irritable appearance characteristic of sympathetic ophthalmia; the ciliary vessels around the cornea are clearly seen, and the ciliary veins are large. The pupil, with a tag of adhesion at the lower point, is rather dilated and almost fixed, having the slightest possible range of action; the aqueous very slightly turbid; the tension of the globe normal. At six inches he can spell words of No. 6 type, but everything appears very dull.

Mr. Critchett at once admitted the patient into the hospital and excised the lost eye, the exciting cause of the irritation in the left; and ordered the left temple to be leeches, and a solution of atropine to be regularly dropped into the left eye. On making a section of the globe, the following changes were found to have occurred:—The iris was lying in contact with the cornea; and connected with it posteriorly,

so as to appear incorporated with it, were some remains of the lens-capsule and the anterior portion of the retina, which extended backwards from this point as a band to the optic-nerve entrance—the whole of it being detached entirely from the choroid. The vitreous had entirely disappeared, and the space between the choroid and retina was filled up with serum. The choroid was *in situ* with the sclerotic, but lying on it was a thin plate of bone.

December 30.—All trouble has ceased since the operation. The fullness of the sclerotic veins has gone, and the globe is fast assuming its white appearance. The pupil is fully under the influence of atropine, but the vision is decidedly clearer than before the operation. Unfortunately, however, this great improvement did not last ; for in a few weeks he again came under the care of Mr. Critchett, with a recurrence of the inflammation.

The following Case illustrates the danger of allowing a foreign body to remain embedded in the eye. For many years, as in this patient, it may give rise to no trouble, but it is always a source of danger ; and at any time, from some accidental or unperceived cause, it may light up an irritation which will involve the other eye in sympathetic ophthalmia :—

CASE VIII.—*Loss of the right eye from the lodgment within it of a portion of a guncap fourteen years previously. Inflammation of the lost eye and sympathetic ophthalmia of the other,—running on to almost complete loss of vision.*

This patient was under the care of Mr. Couper at the Ophthalmic Hospital. His history was as follows :—Whilst shooting in the streets at a target, fourteen years ago, a piece of a guncap flew into his right eye. For some time after he had great pain and inflammation of the eye, which ended in complete loss of sight : he did not even retain perception of light.

The man applied to the hospital on September 2, 1864. He said that up to six months ago he had suffered no trouble with the lost eye, but about that time it became inflamed and painful, and has continued so ever since. The left eye at the same time was sympathetically affected, and with it he can now scarcely distinguish his own hand.

Mr. Couper excised the right eye ; and on making a section of it afterwards, he found a small chip of a guncap embedded in lymph and lying on the ciliary processes : the retina was detached.

The next and last Case are an illustration of sympathetic ophthalmia which has run its course unchecked, and has terminated, as such cases generally do, in almost total blindness.

CASE IX.—*Severe injury to the left eye, followed by complete loss of sight and shrinking of the globe. Sympathetic ophthalmia in the right, and destruction of the eye as an organ of vision.*

James S——, ætat. 12, was brought by his mother up to the hospital from the country to see Mr. Bowman on May 30, 1865. He had met with an injury to the left eye in November 1863. He was endeavouring to look into a pigsty to see a little pig, and in bending his head to look through a chink in the door, he struck his *left* eye against a nail which was projecting from it. The eye was, she believes, ruptured. The child was blind immediately after the accident. After much suffering, extending over between two and three months, the injured eye began to shrink, and continued shrinking until it reached its present state. *The right eye* became sympathetically affected, she thinks, about three months after the primary injury to the left; but she is uncertain as to the exact date, *as he never suffered any pain in it.* The eye at one time looked red, and the lids gummed together in the morning; and he had a slight pricking sensation in the eye, but beyond this he never complained. The sight, at first dim, steadily but gradually, from day to day, became worse and worse, until in about five or six months he was practically blind.

Present State.—*Left eye* shrunk, and fallen back into the orbit; the lids coming together cover it, so

that, unless they are raised with the fingers, the stump of the injured eye is not seen.

The right eye has a very imperfect perception of light. He is just able to distinguish the window, but no more. The eye is soft, its tension —T 2; yet the ciliary veins seen on the surface of the eye are large.

The iris is bulged forward, and almost in contact with the cornea; no anterior chamber can be seen. The pupil is completely closed, and the lens is cataractous. The opaque lens also is carried forward with the iris, so as to be almost in apposition with the cornea. Of course no ophthalmoscopic examination could be made, but, judging from the state of the eye and the defect of vision, it is very probable that the retina is more or less detached. Mr. Bowman saw the patient, and advised that no operation should be performed.

General Conclusions.—The following are the conclusions I have been led to draw from the cases of sympathetic ophthalmia which have come under my care :—

1. That it is an inflammation of one eye, originating solely from an irritation in the other.

2. That the most frequent cause of sympathetic ophthalmia is a wound of one eye, and that those wounds which involve the ciliary region are specially liable to produce it. That it also frequently arises from the irritation communicated to the sound eye from a lost eye, or from the shrunken stump of a

lost eye, which has become subject from some cause or other to recurrent attacks of inflammation.

3. That one of the great peculiarities of sympathetic inflammation is its tendency to the rapid effusion of lymph into all the tissues of the eye which it invades, capable of speedy organisation.

4. That the disease once started is very difficult to arrest; that it is recurrent in its nature, and that, even if the first attack be arrested, a recurrence is almost certain to take place.

5. That the removal of the injured eye affords the best chance of arresting the disease; and if this operation is resorted to in its very early stage, there is a good prospect of its doing so.

6. That if the symptoms of sympathetic ophthalmia are fully developed, the removal of the injured eye (the source of the irritation) may fail to arrest the disease, though it will afford a chance which should not be neglected.

7. That in no instance have I seen sympathetic ophthalmia *originate* in an eye after the other had been removed on account of an injury. I have frequently seen it continue its course after the removal of the injured eye, but in each case sympathetic symptoms were manifested before the eye was removed. Hence the importance of diagnosing in what cases of injury sympathetic ophthalmia is likely to follow, and the necessity of at once excising such injured eyes which are prone to produce it, and especially if they are already lost for all visual purposes.

8. That in the treatment of sympathetic ophthalmia, any operation whilst the eye is inflamed is positively prejudicial; but that when all the activity of the disease has subsided, much may often be done by some operative procedure to regain for the patient some of the sight he has lost, and often also at the same time to prevent a recurrence of the attacks.

9. That in the early stage of the disease the tension of the globe is often increased to $+T$ 1 or 2; but that in the later stage the eye becomes soft from atrophy of the vitreous, causing a diminution in its consistence and bulk, and that this state is often followed by detachment of the retina.

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